ABSTRACT

A method of approximating an ion energy distribution function (IEDF) at a substrate surface of a substrate, the substrate being processed in a plasma processing chamber. There is included providing a first voltage value, the first voltage value representing a value of a first voltage that represents a DC potential (V_{DC}) at the substrate surface. There is also included providing a peak low frequency RF voltage value ($V_{LFRF(PEAK)}$) during plasma processing, the peak low frequency RF voltage ($V_{LFRF(PEAK)}$) value representing a peak value of a low frequency RF voltage (V_{LFRF}) supplied to the plasma processing chamber. There is further included providing a computing device configured to compute the IEDF from the first voltage value and the peak low frequency RF voltage value ($V_{LFRF(PEAK)}$) in accordance with

$$f(E) \equiv \left(\frac{dV_{LF}}{dt} \right)^{-1}, \text{ wherein}$$

$$V_{LF}(t) = \left[\left(\frac{V_{LFRF(PEAK)} - V_{dc}}{2} \right)^{1/2} - \left(\frac{V_{LFRF(PEAK)} - V_{dc}}{8} \right)^{1/2} \sin \omega t \right]^2 .$$